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**Dismounted Mechanized Infantry on the
Future Airland Battlefield:
Is the Squad Big Enough?**

**A Monograph
by
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Infantry**



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First Term AY 90-91

Approved for Public Release; Distribution is Unlimited

91 5 22 147

91-00389



REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 24/12/90		3. REPORT TYPE AND DATES COVERED MONOGRAPH
4. TITLE AND SUBTITLE DISMOUNTED MECHANIZED INFANTRY ON THE FUTURE AIRLAND BATTLEFIELD: IS THE SQUAD BIG ENOUGH? (U)			5. FUNDING NUMBERS	
6. AUTHOR(S) MAJ MICHAEL H. ESPER, USA				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) SCHOOL OF ADVANCED MILITARY STUDIES ATTN: ATZL-SWV FORT LEAVENWORTH, KANSAS 66027-6900 COM (913) 684-3437 AUTOVON 552-3437			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) SEE ATTACHED.				
14. SUBJECT TERMS DISMOUNTED INFANTRY AIRLAND BATTLE-FUTURE MECHANIZED INFANTRY INFANTRY SQUAD HUBA WASS DE CZEGE RELATIVE COMBAT POWER MODEL			15. NUMBER OF PAGES 51	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED	

SCHOOL OF ADVANCED MILITARY STUDIES

MONOGRAPH APPROVAL

Approved for	
By <input checked="" type="checkbox"/>	
Distribution <input type="checkbox"/>	
Availability <input type="checkbox"/>	
Justification	
By	
Distribution	
Availability	
Dist	Avail and/or Special
A-1	

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Accepted this 11th day of February 1991.

ABSTRACT

DISMOUNTED MECHANIZED INFANTRY ON THE FUTURE AIRLAND
BATTLEFIELD: IS THE SQUAD BIG ENOUGH? by
MAJ Michael H. Esper, USA, 51 pages.

This monograph analyzes different organizational sizes for the dismounted element of the mechanized infantry squad on future battlefields. It uses the U.S. Army's new operational concept called AirLand Battle-Future as the setting for the analysis.

The roles and missions of the mechanized infantry are first examined from a historical perspective, primarily the German and American experiences from World War II. The new operational concept is then discussed and tasks for the dismounted element on the future battlefield are examined. Different size squad organizations are introduced and then compared using the criteria of the Huba Wass de Czege Relative Combat Power Model. Two methods of comparison are used. The first studies the different squad structures against the elements of combat power. The second analyzes the organizations against probable missions to be performed using the elements as a criteria.

The monograph concludes that the examined squad organizations may be unable to accomplish their missions after attrition has reduced their size. Some of the organizations at full strength and others even at reduced strengths may be able to perform their assigned tasks, but the successful accomplishment of the mechanized infantry's role is put at risk with smaller dismounted elements. The monograph ends with a short discussion of the implications of small dismounted infantry organizations on both linear and nonlinear battlefields.

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I. INTRODUCTION

The United States Army is evolving an operational concept called AirLand Battle-Future. This concept envisions a nonlinear battlefield dominated by high technology in the intelligence, command and control, and fire support systems. The maneuver units on this type of battlefield are expected to have great mobility and firepower when fighting to counter a modern mechanized threat. In this environment, the centerpiece of the maneuver element will remain a heavy force comprised of tank and mechanized infantry units.

However, the roles of the different members of the combined arms team have not been completely explored nor the impact of any changes on the organization of smaller units. This monograph will examine one member of that team: the dismounted element of the mechanized infantry squad. Both current and future organizations of the mechanized infantry squad will be examined to determine the ability of these organizations to generate dismounted combat power on the battlefield envisioned by the AirLand Battle-Future concept.

The mechanized infantry is defined using the United States Army FM 100-5, Operations, explanation. Mechanized infantry habitually fights with tank forces as part of the combined arms team and complements armor

through its ability to seize and hold ground.

Mechanized infantrymen have the same mobility as tankers, but less firepower and protection. ' 1

Mechanized infantry should not be confused with the motorized infantry which generally fights without tanks and uses wheeled instead of tracked vehicles. In previous decades, mechanized soldiers were called armored infantry by the United States Army. The Germans call them panzer grenadiers.

The purpose of the mechanized infantry has remained constant since its conception in the 1930's. The mechanized infantry was placed with the tanks to insure the momentum of the assault was not halted by terrain, obstacles, or strong antitank defenses. Its primary method of fighting is to dismount and clear the path of resistance, so that the tanks (and today other fighting vehicles) can continue the attack. In the defense, the mechanized infantry covers dismounted avenues of approach, provides close in security for the tanks and fighting vehicles, and acts as a pivot point for maneuvering tank-heavy forces. " 2

A more detailed examination from a historical perspective will furnish valuable insights into the traditional tasks of the dismounted mechanized infantry. These insights will be used as a startpoint for the development of a task list for the dismounted mechanized infantry in the AirLand Battle-Future

concept. Additionally, how and why the size of the dismount element has decreased will be examined from a historical viewpoint to gain a point of departure for examining different dismount element strengths.

As the future battlefield is the setting for the study, the new operational concept will be discussed and the role of the dismounted element of the mechanized infantry on the battlefield of AirLand Battle-Future will be postulated. The tasks of the dismounted element will be examined and a representative number will be used as a basis to compare different mechanized infantry squad organizations.

The organizations of the mechanized infantry squad to be studied are both existing structures and those under design. The specific comparison will occur between the dismounted elements. No new organizations will be proposed, but previous organizations will be examined to provide some insight and background to the current and future structures.

The criteria for comparison of the organizations will be the elements of combat power from the Huba Wass de Czege Relative Combat Power Model. The purpose of the criteria is not to quantify the combat power of the different mechanized infantry squad organizations, but rather to provide a tool for analysis. This scrutiny will provide insights into the strengths and weaknesses

of each organization. Two methods of comparison will be used. The first will study the different squad structures against the elements of combat power. The second will analyze the organizations against the probable missions to be performed on the battlefield of AirLand Battle-Future using the elements as a criteria.

A few assumptions need to be made:

- The organization of the mechanized infantry squad will not exceed eleven men.
- The Future Infantry Fighting Vehicle will be designed for a two man crew: driver and gunner.

Constraints by both manpower budgets and size considerations of the vehicle will limit the strength of the mechanized infantry squad. The second assumption is based on the current concept for the development of the Future Infantry Fighting Vehicle. 3

The Bradley Infantry Fighting Vehicle and its squad will be the primary weapons of the mechanized infantry well into the next century. One of the more frequent criticisms of the Bradley is the lack of infantrymen who exit the vehicle to fight the dismounted infantry battle. Obviously, budget constraints and the equipment development cycle will not immediately allow a replacement for the Bradley in the near term. It is important in the development of the Future Infantry Fighting Vehicle for its design to

meet both the firepower and vehicle protection requirements. Furthermore, the vehicle must dismount an infantry element large enough to accomplish that element's missions on the battlefield foreseen by the AirLand Battle-Future concept. Finally, if the budget will not allow the necessary requirements to be met, then the risk involved in allowing shortfalls must be understood.

This monograph will not recommend a specific size for the dismounted element of the mechanized infantry squad. The focus will be on the ability of different squad sizes to accomplish the selected tasks. Today's Army is designed not necessarily as the most combat effective, but as the one which is the most combat effective within the constraints of the budget. The risks incurred by this type of force design process must be understood up front and compensation made when the force is actually sent to fight.

II. HISTORICAL PERSPECTIVE

The United States Army began to first experiment with armored forces in the late 1920's. The concepts did not gain much headway until the eve of the Second World War. The success of the German Wehrmacht in the Polish campaign of 1939 and the blitzkrieg across France in the spring of 1940 led to a greater

acceptance in this country of tanks supported by mechanized infantry as the premier offensive force for maneuver on the battlefield.

The fledgling American mechanized infantry force took numerous lessons from the German panzer grenadiers. One of the most important was to capitalize on the strengths of one element of the combined arms team to offset the weaknesses of another. These strengths and weaknesses were seen by the Germans as:

STRENGTHS OF TANKS	WEAKNESSES OF DISMOUNTED PANZER GRENADIERS
Protected against shrapnel	Unprotected
Permanently ready to offer fire support	Poorly equipped with armor piercing weapons
Speed of attack	No speed in attack
WEAKNESSES OF TANKS	STRENGTHS OF DISMOUNTED PANZER GRENADIERS
Deaf and partial blindness	Hears and sees everything
Susceptible to anti- tank and close combat weapons	
Large target unable to take avoiding action	Small target and highly mobile
Dependent upon suitable terrain	Can use and fight in any terrain. *

In order to capitalize on the cancellation of weaknesses by strengths, the Wehrmacht wrote the following in the basic regulation for the collaboration of tanks and panzer grenadiers:

... the tank fights the enemy tank and destroys other weapons. The panzer grenadier looks for hidden anti-tank guns and fires on them. He prevents close quarter attack on the tanks. Covered by the tanks, he clears the enemy's position. ... Mutual assistance is essential. ... In good country, the armor moves by bounds from cover to cover, giving fire protection to the panzer grenadiers following. In wooded areas, the panzer grenadiers precede the tanks. ... Panzer grenadiers ... destroy the enemy with the weapons they carry on their vehicles. 5

The same field service regulations further explained the role of the panzer grenadiers:

Every other arm is dedicated to helping the tank advance ... Tanks cannot completely clear the enemy from captured ground, and scattered groups of the enemy may combine to continue the fight. The panzer grenadier regiments follow the tanks in elongated echelon, and, collaborating with the second armored wave, annihilate enemy remnants as well as carrying out the tasks of guarding and securing the rear and flanks of the armored units. Panzer grenadiers hold the areas captured by tanks. Where a tank is obstructed by difficult terrain or by artificial barriers, the panzer grenadiers advance first. The conditions for this are: (a) attacking across rivers; (b) in heavily wooded areas, swamp or badly cut-up terrain; (c) minefields, anti-tank ditches and other tank obstacles; (d) when breaking through enemy anti-tank fronts. The tanks will give supporting fire to the panzer grenadiers' advance. Once past the obstacles, the tanks resume the leadership of the advance.... 6

In 1935, the ratio of panzer grenadier battalions to tank battalions in the armored divisions was three

to seven. By the beginning of the war, testing during exercises had reduced this to approximately one to one. During the famous 1940 campaign across France, the ratio had shifted in the panzer grenadiers favor at five to two. For the Russian campaign in 1941, the ratio had dwindled to four to two, and the number of tanks had also increased from 160 to 200. This remained the standard organization until the end of the war, but it was hardly ever met in either infantry or panzer strength. *

In order to accomplish its tasks, the panzer grenadiers fought in the offense using three methods. The first technique, and most common, was for the infantry to follow the tanks to the vicinity of the objective, or the enemy, and then dismount at what the Germans called a "forming up point." The dismounted infantry then assaulted or cleared the obstacle. The second tactic, and most glamorous, was to drive into the middle of the enemy's position where the panzer grenadiers either fought from the vehicles or dismounted to clear the objective. The least preferred method (because it slowed the attack back to the pace of the walking infantryman) was to begin dismounted, from the line of departure, and move to the objective in the traditional form of the infantry attack. *

The dependence on the panzer grenadiers increased as the war dragged on. This reliance is stated in a memorandum by the Oberkommando des Heeres: "There can be no doubt that, without the closest cooperation of the panzer grenadier and the tank, the latter is of limited value ... It is even said by some that commanders would prefer to lose tanks rather than their infantry...." * Regardless of how the panzer grenadier arrived in the battle, these mechanized infantrymen were indispensable to the German concepts of combined arms and maneuver warfare as the Wehrmacht practiced them during the Second World War. 1*

The United States Army mechanized infantry was known as armored infantry until the late 1950's. These infantrymen had much in common with their World War II German counterparts. One of the first field manuals to be written by the United States Army about armored infantry tactics listed their missions when fighting with tanks as follows:

- Follow a tank attack to wipe out remaining enemy resistance.
- Seize and hold terrain gained by tanks.
- Attack to seize terrain unfavorable for a tank attack.
- Form, in conjunction with artillery and tank destroyers, a base of fire for a tank attack.
- Attack in conjunction with tanks.

- Clear lanes through mine fields alone or in conjunction with engineers.
- Protect tank units in bivouac, on the march, in assembly area, and at rallying points.
- Assist in forcing a river crossing.
- Assist in seizing a bridgehead.
- Establish and reduce obstacles.
- Attack or defend towns.
- Organize and defend a position.
- Perform reconnaissance and counterreconnaissance. ¹¹

According to doctrine, the American mechanized infantry, like the panzer grenadier, fought primarily dismounted. The unit would move as close as possible to the objective by their organic carriers or on the back of tanks. They would not dismount until forced to by either the enemy or restrictive terrain. As with the Wehrmacht's armored personnel carrier, the SdKfz 251, the American M-3 halftrack had no overhead cover and armored protection against only shrapnel and small arms fire at longer ranges. Therefore, mounted assaults were particularly dangerous except against very weak resistance. ¹²

An excellent example of American armored infantry filling its traditional role in the combine arms fight occurred on 6 December 1944, during the attack on the town of Singling in the Lorraine region of Germany.

Team B, of Creighton Abrams' 37th Tank Battalion, assaulted the village at approximately 0830 hours. The force consisted of 14 tanks and 57 infantrymen from Company B of the 51st Armored Infantry Battalion. As the muddy ground proved impassable for the halftracks, the infantry rode on the rear decks of the tanks to a hedge just short of the town. Upon dismounting, the infantry quickly secured a foothold. Using the tanks for supporting fire, they cleared the buildings and held the town against counterattacks until relieved late in the day. It later turned out that Singling was defended by a battalion of panzer grenadiers reinforced by tanks or self-propelled guns. Lieutenant General Fritz Bayerlein, commander of the famous Panzer Lehr Division, personally viewed the action from a nearby hilltop and commented, "...an outstanding armored attack, such as I have rarely seen..." 12

The United States Army's mechanized infantry tactics remained basically the same throughout the next two decades. However, the carriers improved with the introduction of the M-59 armored personnel carrier in the 1950's. The major improvements over the old halftrack included full tracks, overhead protection, and a rearward opening ramp. These changes gave the carrier mobility approximately equal to the tank and

more protection for the dismounting infantry as they exited the rear of the vehicle rather than over the top. As a result, the infantry were able to ride their own carrier to the objective and not on the back of tanks.

The size of the mechanized infantry squad has basically mirrored that of the regular infantry squad from World War II until the present. The strength has varied between nine and twelve men. During the World War II period and into the 1960's the mechanized infantry squad was authorized an additional slot for the assigned driver of the squad carrier. However, no further position was added to man the vehicle's heavy machine gun. When mounted, it was operated by the squad leader; but when the dismount element departed the carrier, the squad leader went with them and the driver would fire the weapon. ¹⁴ Therefore, the dismount element of the squad functioned as a regular infantry squad. Unfortunately, firepower was lost until the driver could man the heavy machine gun.

With the introduction of the Pentomic reorganizations in the mid-1950's, the fire team concept was standardized in the United States Army infantry rifle squads. ¹⁵ This new structure brought with it the addition of a sergeant (E-5) to each squad. This change increased the squad's number of

noncommissioned officers from two to three: a squad leader and two fire team leaders.

The use of these leaders remained consistent in both the mechanized and regular infantry. It was not until the 1970's, that the doctrine for the mechanized infantry began to separate the squad into a carrier team of two men and the rest in the dismount team. The dismount element was then reduced by two men from the regular infantry squad, but continued to operate as two fire teams. One sergeant remained with the vehicle as the gunner. " Meanwhile, the dismount element's second fire team was under the direct control of the squad leader or a senior specialist (SP4) was appointed a corporal and led the fire team. The reason this restructuring of the mechanized infantry squad occurred can not be determined. It can be assumed the need for the constant firepower of the carrier's machine gun was the overriding concern vice the additional dismounted strength and leadership.

The size of the infantry squad (mechanized and regular) remained constant in the 1960's and 1970's at eleven men, but the mechanized infantry's dismount element was reduced to nine men because of the carrier team. A study conducted during the 1950's Pentomic reorganization found that squads needed to be able to conduct fire and maneuver independently of the

platoon. ¹⁷ Another study in 1961 found the optimal size for a squad to maintain its combat power after attrition was eleven men. ¹⁸

Three factors have brought the size of the dismount element down to its current strength. The first was the introduction of the Bradley Infantry Fighting Vehicle as the primary squad carrier of the mechanized infantry in the early 1980's. The maximum size of a squad which could fit into the Bradley was ten men. ¹⁹ Secondly, the 25 millimeter chain gun and TOW antitank guided missile in the Bradley's turret brought a new dimension of firepower to the mechanized infantry. Finally, the formation of two light infantry divisions reduced the number of authorizations available.

The squad's vehicle was no longer just a transporter of infantrymen. The M-2 carried weapon systems which were an integral part of the close combat battlefield concept. Added to the traditional mechanized infantry squad tasks, which had remained virtually unchanged since World War II, was the mission of destroying enemy armored vehicles and tanks.

Originally, the thought was the vehicle's crew would remain constant with a driver and a noncommissioned officer as the gunner. Field testing showed that the ability of the crew to acquire targets

was significantly decreased when the squad leader left the turret with the dismount team. Therefore, the tactics were changed to reflect the need for a three man crew and the dismount element was reduced by one man. As previously stated, the maximum capacity of the Bradley was ten men and with the vehicle crew now increased to three, the largest dismount team possible was seven men.

The last factor to conspire with the aforementioned events, to further reduce the size of the dismount element, was the Army's decision to form two additional light infantry divisions. In the restructuring, the Army was required to maintain the same total strength of approximately 770,000 soldiers. Compensatory reductions were necessary to find authorizations for the 20,000 additional spaces created by the formation of the two new light divisions. One of the primary sources was reduction in the strength of all infantry squads to nine men. As a result, the dismount element of the mechanized infantry squad equipped with Bradley's was reduced to six men. The current field manual which covers Bradley squad tactics calls for this element to fight as one team under the control of a squad leader and an assistant squad leader. 20

Emerging doctrine calls for a return to nine men

dismount elements as the basis for the mechanized infantry squad's combat power. This is to be accomplished without an increase in the strength of the platoon. Under current doctrine, the dismounted platoon consists of three dismount teams of six men each, one from each squad (the platoon leader's Bradley does not have a dismount team). The new organization would form the platoon into two vehicle sections of two Bradley's each with two nine man dismount squads. Each dismounted squad would fight with two fire teams, each led by a team leader under the control of the squad leader. ²¹

III. AIRLAND BATTLE-FUTURE

The United States Army's operational concept for warfighting from 1995 until after the turn of the century is called AirLand Battle-Future. This concept envisions a modification of current doctrine rather than an entire revision. The tenets and imperatives of the 1986 version of AirLand Battle doctrine will remain the same. The environment and threat will have changed, and the warfighting concepts which deal with these changes will be the essence of the variations to the current doctrine.

The transition to the AirLand Battle-Future concept will be caused by six primary factors:

- A shift from a predominately Soviet threat to a more global focus based on regional threats.

- The number of forward deployed units will decrease dramatically to a status better described as forward presence.

- CONUS based forces will be more contingency oriented rather than primarily reinforcing to a specific theater.

- The battlefield will be a mixture of both linear and nonlinear combat to a greater extent than is envisioned in the current doctrine.

- Forces that are less fixed structurally and more tailorable.

- The emphasis will shift from security assistance to nation assistance. ²²

Technological changes will also have a considerable impact in the new concept. As the battlefield becomes increasingly nonlinear, the requirement to know where the enemy is and to be able to significantly attrite him at great distances correspondingly increases. AirLand Battle-Future is based on two critical assumptions:

- "We will know where significant enemy forces are almost all of the time." ²³

- "We will have the capability to engage him at long range, with very accurate and lethal systems...." ²⁴

Doctrinally, the linear offensive and defensive orientation will shift toward a view that is

predominantly nonlinear and offensive in nature. As a result, combat operations will be conducted in four overlapping phases:

- Acquisition
- Fires
- Maneuver
- Reconstitution. ²⁵

The maneuver phase is the one which most concerns this study. This phase will have as its centerpiece armor and infantry forces. And on many of the battlefields the mechanized infantry with its fighting vehicles and dismounted elements will be the predominant type of infantry present.

The maneuver phase will be characterized by "...rapid maneuver of air and ground units...to complete the destruction of enemy forces...." ²⁶ The primary missions expected of the maneuver forces will be movement to contact, attack, exploitation, and pursuit. Forces must quickly deploy from dispersed locations, mass, and provide overwhelming combat power at the point of attack. Obviously, the primary means to accomplish the destruction of the enemy forces in a European or Southwest Asia scenario will be tanks, weapons systems of the infantry fighting vehicles, and the infantry's heavy antiarmor weapons.

The purpose of the mechanized infantry's dismounted elements will remain the same as that of the panzer grenadiers and the American armored infantry of World War II. Their primary mission will still be to maintain the momentum of attack and protect the combat vehicles in restrictive terrain and during periods of limited visibility. Brigadier Richard Simpkin stated this mission succinctly in his futuristic examination of infantry, entitled Mechanized Infantry:

The tactical or operational offensive is the type of combat in which tanks most need infantry support...The task of this infantry...is to maintain the momentum of the advance when the tanks are slowed down or halted by ground, man-made obstacles or defensive fires planned to exploit awkward terrain....I suggest helping to get tanks forward is what in-house infantry is mainly about...." 27

Two current manuals provide an excellent startpoint for determining the squad level tasks the dismounted element of the 'in house infantry' must perform to be successful on the future battlefield. ARTEP 7-8-MTP, Mission Training Plan for the Infantry Rifle Platoon and Squad, details the collective tasks by battlefield operating system to each of the squad and platoon missions. FM 7-7J, The Mechanized Infantry Platoon and Squad (Bradley), is the doctrine for how the mechanized infantry will fight at the small unit level.

The Mission Training Plan breaks down the squad missions to movement to contact, attack, raid, ambush, recon/security, defend, and retrograde. As discussed above, the AirLand Battle-Future missions are offensively oriented and require the infantry to maintain the momentum of the attack and protect the force. The maneuver tasks which fit the AirLand Battle-Future missions for dismount elements are:

- Assault
- Overwatch/Support by Fire
- Move Tactically
- Cross Danger Area
- Clear Woodline
- Clear Building
- Cross Defile. 28

The mobility and survivability tasks which will have more significance in AirLand Battle-Future are:

- Breach Obstacle
- Construct Obstacles
- Cross Water Obstacle
- Maintain Operations Security. 29

The intelligence tasks which the nonlinear battle will bring to prominence are:

- Reconnoiter Area
- Occupy OP/Perform Surveillance. 30

Four other tasks which do not appear in the Mission Training Plan are significant enough to mention. These tasks are derived from examining the dismount element doctrine, grouping tasks from ARTEP 7-8-MTP, or identifying crucial subtasks from the Mission Training Plan training and evaluation outlines. Again, the tasks listed are those critical to the dismount element's purpose in AirLand Battle-Future. The additional tasks are:

- Conduct Patrolling Operations
- Provide Close-in Security for Fighting Vehicles During the Assault
- Provide Local Security for Combat Vehicles in Restrictive Terrain and During Limited Visibility
- Conduct Fire and Maneuver.

In order to conduct a comparison of the different organizations being considered for the dismount element in the future, five of the above tasks will be used. These five were selected because of the offensive nature and importance of uninterrupted maneuver in the AirLand Battle-Future concept. The five tasks selected are:

- Provide Local Security for Combat Vehicles in Restrictive Terrain and During Limited Visibility
- Conduct Fire and Maneuver.
- Breach Obstacle
- Clear Woodline
- Cross Defile.

IV. HUBA WASS DE CZEGE RELATIVE COMBAT POWER MODEL

Huba Wass de Czege developed the Relative Combat Power Model to be used as a tool for analysis of tactical level combat. The model uses a comparison of combat power relative to that of the enemy as an analytical framework for the examination of war to help prepare the Army's leaders for the rigors of the next battle. " It is not intended to be used as a quantitative method to place numbers against the friendly or enemy combat power. Rather, the model provides insights into the elements which generate combat power and the interrelationship of the friendly and enemy forces.

Wass de Czege defined combat power as being generated by four elements:

- Leadership
- Maneuver
- Firepower
- Protection.

The elements themselves will be the criteria for the comparison of the different dismount team organization rather than the model as a whole. But, it remains important to understand the relationships between the elements and the conclusions that the model can afford.

According to Wass de Czege, the combat power generated by the elements is not a measure of "...unapplied or misapplied potential...." ²² Rather it is a measure of the effect "...which influences the outcome of the battle...[and it] has meaning only as it compares to that of the enemy...." ²³ Therefore, the cumulative effect of the combat power, as generated by the elements, relative to the enemy's combat power determines the outcome of the battle.

The model, which was developed, took the form of a mathematical equation:

**HUBA WASS DE CZEGE
RELATIVE COMBAT POWER MODEL**

$$L_r (F_r + M_r + P_r - D_e) - L_e (F_e + M_e + P_e - D_r) = \text{OUTCOME OF THE BATTLE}$$

L-leadership	_, -friendly effect
F-firepower	_, -enemy effect
P-protection	D -degradation ²⁴

The model stresses the significant role that leadership plays in the overall generation of combat power. Its effect is proportionately greater because as the multiplier it enhances the effect of all the other elements. The placement of degradation on the opposite sides of the minus sign focuses attention on the effect of degradation being a detractor from the enemy's

combat power and being enhanced by the leadership effect.

The primary elements to be used as the criteria in the analysis of the dismount team organizations are firepower, maneuver, and protection. The effect of leadership on the moral domain of battle will not be addressed because the personalities of the different organizations' leaders and their technical and tactical competence are assumed to be equal. Span of control issues and use of subordinate leaders will be compared from the cybernetic viewpoint.

V. DISMOUNT ELEMENT ORGANIZATIONS

The primary focus of the analysis of the organizations will be on the dismount team strength. However, an examination of the vehicle type and the total squad strength is helpful for gaining a more complete perception of the dismount element's functions and roles. Initially, each organization will be described with a specific table of organization and equipment (TOE) number. Hypothetical and future TOE's will not be described using TOE number. Eventually, all organizations will be given a descriptive nickname that will be used through the remainder of the monograph. Additionally, an appendix will be provided.

The first two organizations to be discussed are based on the M-113 Armored Personnel Carrier and are provided only as background for the analysis. Until all infantry squads were downsized in the early 1980's, TOE 07-045H provided the standard mechanized infantry squad organization. The squad strength was eleven men. A driver and carrier team leader (a sergeant) remained with the vehicle under most circumstances. This structure provided a nine soldier dismount element organized as two fire teams of four men each and a squad leader (a staff sergeant). Additionally, the other sergeant (E-5) dismounted as a team leader. The experience of the author was for another team leader to be designated from the squad's junior enlisted men (ranks E-1 to E-4). This organization will be called the 'M-113, H-series' organization.

The second M-113 organization was assigned nine men under TOE 07-245J420. Once again, the carrier team consisted of a driver and a team leader. The dismount team was led by the squad leader and was composed of a three man fire team and a four man fire team. Doctrine called for one team to be led by an assigned team leader, while the squad leader performed the other team leader's duties in addition to his traditional ones. This design will be called the 'M-113, J-series' organization.

Concurrent with the downsizing of the infantry squad, the introduction of the Bradley Infantry Fighting Vehicle brought with it a new organization. TOE 07-245J410 organized the mechanized infantry squad with nine soldiers. The vehicle team consisted of three men: a noncommissioned gunner, the driver, and the assistant squad leader. Initially, doctrine envisioned only two soldiers remaining with the vehicle, but experience quickly showed that the turret weapon systems were not as effective with only one man. The vehicle commander station needed to be filled for target acquisition and overall maneuver of the Bradley. The three man vehicle team left only six men for the dismount element. The dismount team was organized as one team with the squad leader as the team leader and the squad's other sergeant functioning as an assistant squad leader. ³⁵ Appropriately, the nickname for this dismount element is the 'Bradley' organization.

A recent doctrinal development would return nine man dismount squads to the mechanized infantry platoon. However, as there would be no increase to the platoon's strength, only two squads could be formed. Each dismount squad would be organized with two four man fire teams, each led by a sergeant fire team leader, and a staff sergeant squad leader. ³⁶ The moniker for this structure will be the 'new Bradley' organization.

The last organization to be studied is the one conceived for the Future Infantry Fighting Vehicle (FIFV). A nine man squad would remain the base structure, but technology will allow for the vehicle team to be reduced to a driver and a gunner. Therefore, the dismount team would have a strength of seven soldiers. Although doctrine has not been developed, the organization of the dismount element will be assumed to have the same design as the 'M-113, J-series' structure. This organization will be called the 'FIFV' organization.

At one time, the Bradley could have been equipped with a tenth seat. And, if authorized the additional man, the squad could have been structured with a slightly larger dismount element of seven men. This dismount element could then have been organized the same as the dismount team under TOE 07-245J420. This structure will be called the 'Bradley plus' organization. This organization will not be analyzed separately, but is furnished as a point of discussion for transition from the Bradley to the FIFV.

The following chart is a summary of the organizations to be compared in the analysis segment of the monograph:

DISMOUNT TEAM ORGANIZATIONS

ORGANIZATION	TOTAL	CARRIER TM	DISMOUNT TM
Bradley	9	3	6
New Bradley *	-	-	9
FIFV	9	2	7
M-113, H-series **	11	2	9
M-113, J-series **	9	2	7
Bradley plus **	10	3	7

* In this organization the dismount squads are separate organizations from the vehicle sections. Each Bradley still retains a crew of three.

** These organizations are provided for discussion only and will not be analyzed.

VI. GENERAL COMPARISON OF DISMOUNT TEAMS

Each of the elements of combat power from Huba Wass de Czege's Relative Combat Power will be used to compare the different dismount team organizations:

- Leadership
- Firepower
- Maneuver
- Protection.

The individual elements of combat power will be further broken down and the squads compared in general against the model's elements. This general comparison is not intended to be an all-inclusive, but rather a partial one that provides insights for the comparison of the

dismount team organizations through the medium of the representative combat mission list.

As previously discussed, the element of leadership will be used only as it applies in the cybernetic domain. Three issues stand to the forefront:

- the ratio of leaders to soldiers,
- the ratio leaders to fire teams, and
- the span of control for the squad leader.

Each of the dismount team organizations is provided with leaders as shown in the chart. The ratios for leaders to soldiers, ratios of leaders to fire teams, and span of control for the squad leaders is shown.

LEADERSHIP

ORG	LDR	SQD LDR SPAN OF CONTROL	TM LDR SPAN OF CONTROL	LDR/ FIRE TM
Bradley	1	1:5	1:5	1:1
New Bradley	3	1:2	1:3	3:2
FIFV *	2	1:4	1:2, 1:3	2:2

* Assumes the squad leader controls a three man fire team and one fire team leader. This team leader would control two men in his team.

The U.S. Army accepts the optimum span of control as between 3 and 5. Most of its organizations are

designed with three or four subordinate maneuver elements. An analysis of the above comparison shows that the most effective organization from the span of control standpoint would be the 'new Bradley' dismount squad of nine infantrymen. This organization better meets the U.S. Army's optimum for span of control than the other dismount elements. A leader should not have to command a subordinate element as well as his own unit. Once again, the 'new Bradley organization' meets this requirement. Between the other two organizations, the edge would go to the 'FIFV' dismount team because of the 'Bradley' organization's larger spans of control.

A few assumptions must be made relating to equipment, prior to making comparisons concerning firepower. First, each dismount element will be equipped with two automatic rifles, two grenade launchers, and one medium antitank weapon. All other soldiers in the dismount team are equipped with rifles. The next assumption is that each type weapon is the same for each organization. For discussion, the weapons will be the M-16A2 rifle, M-249 Squad Automatic Weapon (SAW), the M-203 grenade launcher, and the Advanced Antitank Weapons System-Medium (AAWS-M). Finally, attrition is assumed to be 25% when comparing the organizations after casualties, and the number of casualties will be rounded up. ³⁷

The sub-elements chosen for comparison are the volume of firepower, the span of control, the number of

leaders carrying a weapon other than a rifle (hereafter referred to as a key weapon). These components will be examined both before and after a 25% attrition is applied. The two charts shown below display the comparison.

FIREPOWER AT FULL STRENGTH

ORG	VOL *	LARGEST SPAN OF CONTROL FOR A LEADER	LDR'S MANNING KEY WEAPONS
Bradley	+1	5	1 ²⁴
New Bradley	+5	3	2 ³⁹
FIFV	+2	4	1

Note: * a plus sign indicates the number of riflemen in the dismount team after all the key weapons are manned

FIREPOWER AFTER 25% ATTRITION

ORG	VOL *	LARGEST SPAN OF CONTROL FOR A LEADER	LDR'S MANNING KEY WEAPONS
Bradley	-1	3	1
New Bradley	+1	3	2
FIFV	0	3	2

Note: * a plus sign indicates the number of riflemen in the dismount team after the key weapons are manned; a minus sign indicates that a key weapon cannot be manned, and a '0' indicates only key weapons are manned

Once again, the 'new Bradley' dismount element appears to be the most effective organization in terms of firepower. This advantage appears both before and after attrition. The most effective between the other two structures is the 'FIFV' dismount element because all of the key weapons are still manned after attrition. No other significant firepower advantages are apparent between these two designs.

Three components of the maneuver element of combat power will be used for comparison:

- ability to fire and maneuver by fire teams,
- span of control
- use of subordinate leaders.

Again, the organizations will be examined both before and after 25% attrition. Two assumptions need to be made:

- the minimum size for a squad to perform fire and maneuver by fire teams is six men and at least two leaders must be assigned
- leadership positions will be filled in spite of casualties.

The comparison is shown in the charts drawn below.

MANEUVER AT FULL STRENGTH

ORG	ABILITY TO FIRE AND MANEUVER	LARGEST SPAN OF CONTROL FOR A LDR	NUMBER OF SUBORDINATE LEADERS
Bradley	N	5	0
New Bradley	Y	3	2
FIFV	Y	4	1

MANEUVER AFTER 25% ATTRITION

ORG	ABILITY TO FIRE AND MANEUVER	LARGEST SPAN OF CONTROL FOR A LDR	NUMBER OF SUBORDINATE LEADERS
Bradley	N	3	0
New Bradley	Y	2	2
FIFV	N	4	1

The nine man 'new Bradley' dismount squad is again the most functional of the three organizations. It is the only one of the three that can continue to perform fire and maneuver after attrition. The 'FIFV' dismount team would also be more effective after attrition than the 'Bradley' dismount element because it has an additional leader to assist the squad leader in maneuvering the one fire team.

The comparison of the different dismount teams by the combat power element of protection will use four components:

-Frontage

-Ability to conduct an antiarmor ambush patrol

-Ability to conduct a recon patrol

-Number of three man OP's that the element can maintain.

The frontage the element can cover is defined as the number of two man fighting positions that the dismount element can man multiplied by ten meters. If a man is left over, then one three man position would be prepared. An antiarmor ambush patrol requires seven men; therefore, augmentation from the vehicle team may be necessary for dismount elements of six men or less. ⁴⁰

A recon patrol can be accomplished by one element or two. A two element patrol (recon and security) would require two leaders and a minimum of five men. ⁴¹ A three man OP was selected because it can provide a soldier approximately 8 hours of sleep on a continuous basis with the other two men performing observation and surveillance tasks. A chart for both before and after 25% attrition is shown below.

PROTECTION AT FULL STRENGTH

ORG	FRONTAGE COVERED	ANTIARMOR AMBUSH PATROL	RECON PATROL	OP'S
Bradley	30m	N	N	2
New Bradley	40m	Y	Y	3
FIFV	30m	Y	Y	2

PROTECTION AFTER 25% ATTRITION

ORG	FRONTAGE COVERED	ANTIARMOR AMBUSH PATROL	RECON PATROL	OP'S
Bradley	20m	N	N	1
New Bradley	30m	N	Y	2
FIFV	20m	N	Y	1

As with the other three elements of combat power, the 'new Bradley' organization is judged the most effective both before and after attrition. Although, the margin between the 'new Bradley' dismount squad and the 'FIFV' dismount team is small. When the number of squads in platoon is factored in, then the difference at the platoon level is only one OP.

Overall, the 'new Bradley' dismount squad provides the most effective structure, when compared with the other two organizations. It ranked highest in all four elements of combat power. The 'FIFV' organization

would appear to get the edge over the 'Bradley' organization.

VII. COMPARISON BY MISSIONS

The five missions selected as a basis for comparison are:

- Provide Local Security for Combat Vehicles in Restrictive Terrain and During Limited Visibility
- Conduct Fire and Maneuver.
- Breach Obstacle
- Clear Woodline
- Cross Defile.

As previously discussed, these tasks were determined to be representative of those which were necessary for the mechanized infantry dismount element to discharge its primary purpose on the future battlefield.

The 'Bradley' organization can perform the following tasks before attrition:

- Clear a Woodline
- Clear a Defile
- Provide Local Security for Combat Vehicles in Restrictive Terrain and During Limited Visibility.

In order to accomplish the other two tasks, the dismount team must be augmented or act as part of the platoon.

The task, Breach an Obstacle, requires the

dismount team to form two elements: a support team and a breach team. Because the breach team requires four men, ⁴² the support team would lack firepower as it contains only two soldiers. Ideally, this support element would require a minimum of four men so that it could man the squad's two SAW's and the two grenade launchers. Additionally, only one team would have a leader with it. Therefore, the dismount team would require a leader to dismount from the vehicle and for an additional squad's dismount team to provide close-in security.

The 'Bradley' dismount team could not perform fire and maneuver because it is organized as only one fire team. Additionally, this organization could not perform the movement techniques of travelling overwatch or bounding overwatch except as part of a platoon. This may result in the platoon making contact with a squad's entire dismount team, rather than a smaller fire team size element. ⁴³

Finally, after 25% attrition, the dismount element cannot provide both an observation post and close in security for the vehicles. The dismount team at this level of strength can do little more than man one or two positions. And in addition, it is reduced to providing a recon patrol of one four man element.

The 'FIFV' organization could accomplish all but

one of the tasks while at full strength. The dismount team would only have three soldiers in the support element for breaching an obstacle. Once again, the organization cannot provide a minimum of four soldier's to man the element's SAW's and M-203's. Additionally, the 'FIFV' organization dismount team after 25% attrition would be unable to perform the tasks:

- Conduct Fire and Maneuver.

- Breach Obstacle.

- Provide Local Security for Combat Vehicles in Restrictive Terrain and During Limited Visibility.

The same reasons as cited above for the 'Bradley' dismount team being unable to accomplish these three tasks are applicable to the 'FIFV' organization.

A full strength 'new Bradley' dismount squad can perform all of the representative tasks. The only task the 'new Bradley' organization would be unable to perform after 25% attrition is: Breach an Obstacle. As with the other two organizations the dismount team would have an insufficient number of soldiers to form a support team with adequate firepower.

The standard for the platoon task, Clear a Defile, would have to be revised for the 'new Bradley' organization. The current standard requires three maneuver elements to properly clear the defile: one for security on each flank and one to clear the defile. ** The 'new Bradley' platoon organization has only two

dismount squads.

A mission matrix is shown below which shows the ability of the different organizations to perform the tasks. The ability to accomplish the task both before and after attrition are shown on the first line, while the elements of combat power which preclude accomplishment are on the second line.

MISSION MATRIX

ORG	P S	C F M	B O	C W	C D
	E E	O I A	R B	L O	R E
	R C	N R N	E S	E O	O F
	F U	D E E	A T	A D	S I
	O R	U U	C A	R L	S L
	R I	C A V	H C	I	E
	M T	T N E	L	N	
	Y	D R	E	E	
Bradley	Y/N P	N/N M,P	N/N F,L	Y/Y	Y/Y
New Bradley	Y/Y	Y/Y	Y/N F	Y/Y	Y/Y
FIFV	Y/N P	Y/N M,P	N/N F	Y/Y	Y/Y

VIII. CONCLUSIONS

The elements from Huba Wass de Czege's Relative Combat Power Model are a useful way to examine the ability of different dismount elements to accomplish

mission tasks. Although leadership is the most important element in the model, the critical elements for mission accomplishment of the representative tasks were firepower and protection. Additionally, the leadership at a minimum was adequate for the size and organization of the dismount element.

As previously stated, manpower constraints and vehicle size have played a role in the development of dismount organizations. These factors are applicable in the design of two of the three organizations. A lack of manpower in the 'Bradley' dismount team reduces its firepower effect to such an extent that even before attrition this organization cannot perform two of the five representative tasks without reinforcement. The same lack of manpower, and therefore firepower, occurs with a full strength 'FIFV' dismount element. The 'new Bradley' organization could perform all five tasks. After attrition, all the dismount element organizations lost the ability to perform every task.

A full strength 'new Bradley' dismount squad could adequately perform the missions required of it on the battlefield of the AirLand Battle-Future concept. However, previous studies have shown the minimum number of soldiers needed in an infantry squad to account for attrition is eleven. ⁴⁵ This ideal size for an infantry squad is confirmed by the analyses of the

comparisons. For example, a dismount element would require eight soldiers after attrition to accomplish the task - Breach an Obstacle. Therefore, the same element at full strength would require the addition of three soldiers (a total of eleven) to account for attrition.

From the analyses conducted, the minimum size a dismount element could be in order to accomplish all of the tasks is eight. The 'new Bradley' dismounted infantry squad is the only one of the three examined which possess this strength. The others were designed by a process more concerned with the saving of spaces than with the realistic development of an organization based on the realities of the battlefield.

IX. IMPLICATIONS

At full strength, the current and proposed organizations of the mechanized infantry could perform the tasks required by the AirLand Battlefield-Future concept only with some degradation. However, after attrition, the dismounted elements may not be able to perform all their missions. The methods, techniques, and procedures written in the tactical doctrine for mechanized infantry squads and platoons must take this into account. Different organizations may require

their own unique versions in order to accomplish their tasks. For example, a 'Breach an Obstacle' might not be included in the task list for a 'Bradley' squad, but remain on the 'new Bradley' squad's list.

One of the possible reasons for an overall shortage of dismounted infantry is the size of the mechanized infantry squad. With its proposed force structure and organizational designs, the United States Army risks having a shortage of dismounted mechanized infantrymen in future conflicts. However, the offensive, maneuver warfare required on the nonlinear battlefield may allow such a risk to be acceptable. But, if the fight bogs down into a linear, more attrition based style of war, then that risk could have disastrous results. This risk must be accounted for in the doctrine which will come from the operational concept called AirLand Battle-Future.

X. SUMMARY

The tasks of the dismounted mechanized infantry have remained constant since its inception in the 1930's. Their concept of employment has always been best suited for an offensive, maneuver based style of war, like that foreseen by AirLand Battle-Future. However, dismount strengths have been whittled down to

such a degree that the tasks of the mechanized infantry squad cannot be performed without incurring risk. Recent organizational changes in the Bradley rifle squad and the proposed design of the 'FIFV' rifle squad have lessened this risk by providing for a larger dismounted team in the mechanized infantry. Although, personnel losses may still cause these squads to lack sufficient strength to accomplish their missions. Only, the fields of battle in the next decade will actually reveal if there are enough dismounted soldiers in the mechanized infantry squad.

Appendix A: Dismount Team Organizations Pull Out

DISMOUNT TEAM ORGANIZATIONS

ORGANIZATION	TOTAL	CARRIER TM	DISMOUNT TM
Bradley	9	3	6
New Bradley *	-	-	9
FIFV	9	2	7
M-113, H-series **	11	2	9
M-113, J-series **	9	2	7
Bradley plus **	10	3	7

* In this organization the dismount squads are separate organizations from the vehicle sections. Each Bradley still retains a crew of three.

** These organizations are provided for discussion only and will not be analyzed.

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